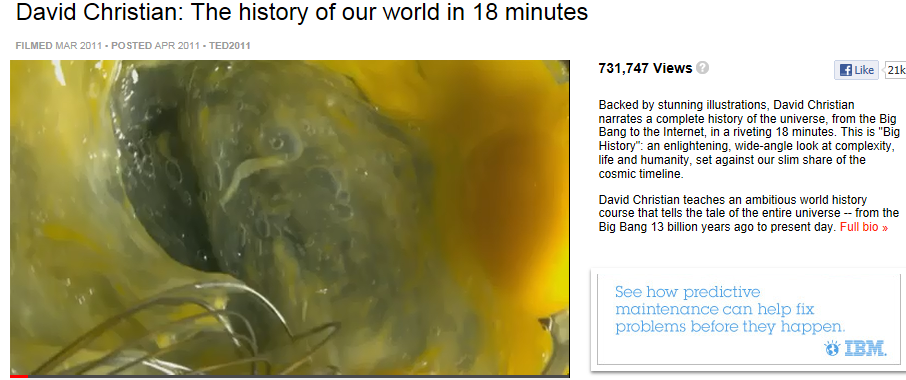
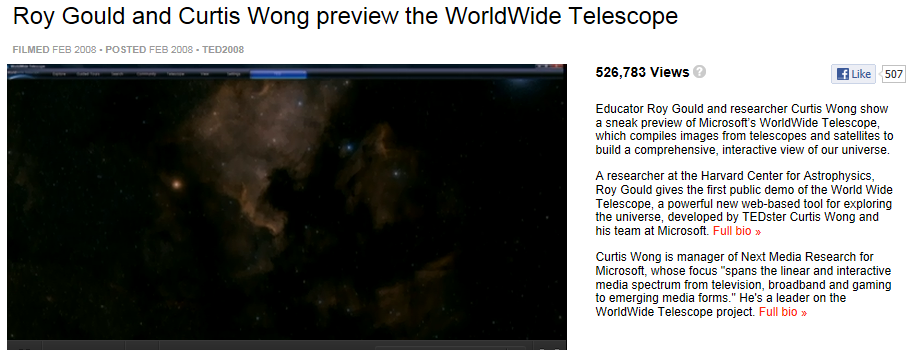
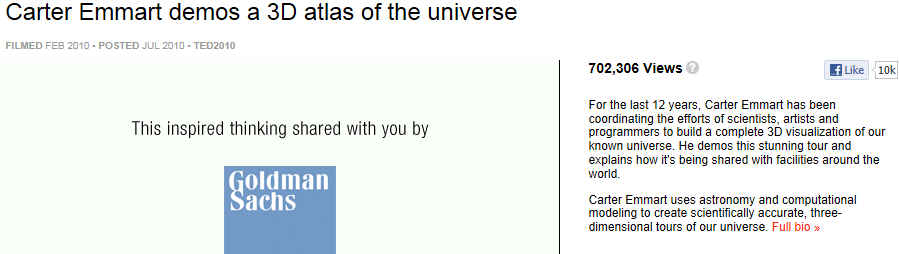
 [**http://www.ted.com/talks/stephen\_hawking\_asks\_big\_questions\_about\_the\_universe.html**](http://www.ted.com/talks/stephen_hawking_asks_big_questions_about_the_universe.html)

**<http://www.ted.com/talks/david_christian_big_history.html>**

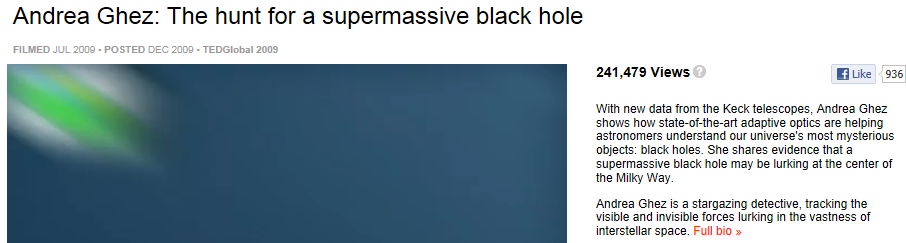
*  HS-ESS1-b. Construct explanations based on observable astronomical data as empirical evidence of the Big Bang theory and the role the development of technologies have played in obtaining this data. ( Red shift is evidence of expansion: Composition of matter in the universe (location- stars) and composition (electromagnetic spectrum- ¾ H, ¼ helium).

[**http://www.ted.com/talks/roy\_gould\_and\_curtis\_wong\_preview\_the\_worldwide\_telescope.html**](http://www.ted.com/talks/roy_gould_and_curtis_wong_preview_the_worldwide_telescope.html)

[**http://www.ted.com/talks/carter\_emmart\_demos\_a\_3d\_atlas\_of\_the\_universe.html**](http://www.ted.com/talks/carter_emmart_demos_a_3d_atlas_of_the_universe.html)

* HS-ESS1-a Use models to describe the sun’s place in space in relation to the Milky Way galaxy and the distribution of galaxies and galaxy clusters in the Universe.

 <http://www.ted.com/talks/george_smoot_on_the_design_of_the_universe.html>



<http://www.ted.com/talks/andrea_ghez_the_hunt_for_a_supermassive_black_hole.html>

**11 talks** (Curated by TED)

* 1.Carolyn Porco: This is Saturn

[Carolyn Porco: This is Saturn](http://www.ted.com/talks/carolyn_porco_flies_us_to_saturn.html)

17:09

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

Planetary scientist Carolyn Porco shows images from the Cassini voyage to Saturn, focusing on its largest moon, Titan, and on frozen Enceladus, which seems to shoot jets of ice.

TED2007, Filmed Mar 2007, Posted Oct 2007

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

* 2.Bill Stone: The caves and the moon

[Bill Stone: The caves and the moon](http://www.ted.com/talks/bill_stone_explores_the_earth_and_space.html)

17:43

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

Bill Stone, a maverick cave explorer who has plumbed Earth’s deepest abysses, discusses his efforts to mine lunar ice for space fuel and to build an autonomous robot for studying Jupiter’s moon Europa.

TED2007, Filmed Mar 2007, Posted Jun 2007

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

* 3.Janna Levin: The sound the universe makes

[Janna Levin: The sound the universe makes](http://www.ted.com/talks/janna_levin_the_sound_the_universe_makes.html)

17:43

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

We think of space as a silent place. But physicist Janna Levin says the universe has a soundtrack -- a sonic composition that records some of the most dramatic events in outer space. (Black holes, for instance, bang on spacetime like a drum.) An accessible and mind-expanding soundwalk through the universe.

TED2011, Filmed Mar 2011, Posted Mar 2011

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

* 4.Stephen Hawking: Questioning the universe

[Stephen Hawking: Questioning the universe](http://www.ted.com/talks/stephen_hawking_asks_big_questions_about_the_universe.html)

10:12

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

In keeping with the theme of TED2008, professor Stephen Hawking asks some Big Questions about our universe -- How did the universe begin? How did life begin? Are we alone? -- and discusses how we might go about answering them.

TED2008, Filmed Feb 2008, Posted Apr 2008

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

* 5.Brian Cox: Why we need the explorers

[Brian Cox: Why we need the explorers](http://www.ted.com/talks/brian_cox_why_we_need_the_explorers.html)

16:29

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

In tough economic times, our exploratory science programs -- from space probes to the LHC -- are first to suffer budget cuts. Brian Cox explains how curiosity-driven science pays for itself, powering innovation and a profound appreciation of our existence.

TEDSalon London 2010, Filmed Apr 2010, Posted Jun 2010

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

* 6.Patricia Burchat: Shedding light on dark matter

[Patricia Burchat: Shedding light on dark matter](http://www.ted.com/talks/patricia_burchat_leads_a_search_for_dark_energy.html)

16:09

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

Physicist Patricia Burchat sheds light on two basic ingredients of our universe: dark matter and dark energy. Comprising 96% of the universe between them, they can't be directly measured, but their influence is immense.

TED2008, Filmed Feb 2008, Posted Aug 2008

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

* 7.Phil Plait: How to defend Earth from asteroids

[Phil Plait: How to defend Earth from asteroids](http://www.ted.com/talks/phil_plait_how_to_defend_earth_from_asteroids.html)

14:16

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

What's six miles wide and can end civilization in an instant? An asteroid -- and there are lots of them out there. With humor and great visuals, Phil Plait enthralls the TEDxBoulder audience with all the ways asteroids can kill, and what we must do to avoid them.(Filmed at [*TEDxBoulder*](http://www.ted.com/tedx/events/2558).)

TEDxBoulder, Filmed Sep 2011, Posted Nov 2011

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

* 8.Burt Rutan sees the future of space

[Burt Rutan sees the future of space](http://www.ted.com/talks/burt_rutan_sees_the_future_of_space.html)

19:37

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

In this passionate talk, legendary spacecraft designer Burt Rutan lambasts the US government-funded space program for stagnating and asks entrepreneurs to pick up where NASA has left off.

TED2006, Filmed Feb 2006, Posted Oct 2006

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

* 9.Sean Carroll: Distant time and the hint of a multiverse

[Sean Carroll: Distant time and the hint of a multiverse](http://www.ted.com/talks/sean_carroll_distant_time_and_the_hint_of_a_multiverse.html)

15:54

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

Cosmologist Sean Carroll attacks -- in an entertaining and thought-provoking tour through the nature of time and the universe -- a deceptively simple question: Why does time exist at all? The potential answers point to a surprising view of the nature of the universe, and our place in it.(Filmed at [*TEDxCaltech*](http://www.ted.com/tedx/events/752).)

TEDxCaltech, Filmed Jan 2011, Posted May 2011

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

[Brian Greene: Is our universe the only universe?](http://www.ted.com/talks/brian_greene_why_is_our_universe_fine_tuned_for_life.html) 21:47

[Show details](http://www.ted.com/playlists/16/way_way_out_there.html)

Is there more than one universe? In this visually rich, action-packed talk, Brian Greene shows how the unanswered questions of physics (starting with a big one: What caused the Big Bang?) have led to the theory that our own universe is just one of many in the "multiverse."

[Download](http://www.ted.com/playlists/16/way_way_out_there.html)

"Our universe [may be] but one bubble in a grand cosmic bubble bath of universes. — Brian Greene (at 15:58)"

<http://www.ted.com/quotes/our_universe_may_be_but_one_bubble_in_a_grand_cosmic_bubble.html>

[Martin Hanczyc quoted: "If we went to another planet and we thought there might be life there, how could we even reco..."](http://www.ted.com/quotes/if_we_went_to_another_planet_and_we_thought_there_might_be_lif.html)

[Martin Hanczyc: The line between life and not-lifehttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/if_we_went_to_another_planet_and_we_thought_there_might_be_lif.html)

"If we went to another planet and we thought there might be life there, how could we even recognize it as life? — Martin Hanczyc (at 12:59)"

<http://www.ted.com/quotes/if_we_went_to_another_planet_and_we_thought_there_might_be_lif.html>

##### [Lucianne Walkowicz quoted: "In just over two years of operations, we’ve found over 1,200 potential new planetary syst..."](http://www.ted.com/quotes/in_just_over_two_years_of_operations_we_ve_found_over_1_200_p.html)

[Lucianne Walkowicz: Finding planets around other starshttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/in_just_over_two_years_of_operations_we_ve_found_over_1_200_p.html)

"In just over two years of operations, we’ve found over 1,200 potential new planetary systems around other stars. — Lucianne Walkowicz (at 01:07)"

<http://www.ted.com/quotes/in_just_over_two_years_of_operations_we_ve_found_over_1_200_p.html>

##### [Joel Levine quoted: "The crust of the Earth has been recycled. We have no geological record prior to the first billio..."](http://www.ted.com/quotes/the_crust_of_the_earth_has_been_recycled_we_have_no_geologica.html)

[Joel Levine: Why we need to go back to Marshttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/the_crust_of_the_earth_has_been_recycled_we_have_no_geologica.html)

"The crust of the Earth has been recycled. We have no geological record prior to the first billion years. That record exists on Mars. — Joel Levine (at 07:19)"

<http://www.ted.com/quotes/the_crust_of_the_earth_has_been_recycled_we_have_no_geologica.html>

##### [Bertrand Piccard quoted: "Pioneering spirit should continue, not to conquer the planet or space … but rather to impro..."](http://www.ted.com/quotes/pioneering_spirit_should_continue_not_to_conquer_the_planet_o.html)

[Bertrand Piccard's solar-powered adventurehttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/pioneering_spirit_should_continue_not_to_conquer_the_planet_o.html)

"Pioneering spirit should continue, not to conquer the planet or space … but rather to improve the quality of life. — Bertrand Piccard (at 09:24)"

<http://www.ted.com/quotes/pioneering_spirit_should_continue_not_to_conquer_the_planet_o.html>

##### [Garik Israelian quoted: "If you see, in the spectrum of a planet host star, strange chemical elements, it can be a si..."](http://www.ted.com/quotes/if_you_see_in_the_spectrum_of_a_planet_host_star_strange_che.html)

[Garik Israelian: How spectroscopy could reveal alien lifehttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/if_you_see_in_the_spectrum_of_a_planet_host_star_strange_che.html)

"If you see, in the spectrum of a planet host star, strange chemical elements, it can be a signal from a civilization which is there. — Garik Israelian (at 13:28)"

<http://www.ted.com/quotes/if_you_see_in_the_spectrum_of_a_planet_host_star_strange_che.html>

##### [Carolyn Porco quoted: "Imagine the day when we might journey to the Saturnine system, and visit the Enceladus interpl..."](http://www.ted.com/quotes/imagine_the_day_when_we_might_journey_to_the_saturnine_system.html)

[Carolyn Porco: Could a Saturn moon harbor life?http://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/imagine_the_day_when_we_might_journey_to_the_saturnine_system.html)

"Imagine the day when we might journey to the Saturnine system, and visit the Enceladus interplanetary geyser park, just because we can. — Carolyn Porco (at 03:06)"

<http://www.ted.com/quotes/imagine_the_day_when_we_might_journey_to_the_saturnine_system.html>

##### [Jill Tarter quoted: "Ultimately, we actually all belong to only one tribe, to Earthlings."](http://www.ted.com/quotes/ultimately_we_actually_all_belong_to_only_one_tribe_to_earth.html)

[Jill Tarter's call to join the SETI searchhttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/ultimately_we_actually_all_belong_to_only_one_tribe_to_earth.html)

"Ultimately, we actually all belong to only one tribe, to Earthlings. — Jill Tarter (at 19:37)"

<http://www.ted.com/quotes/ultimately_we_actually_all_belong_to_only_one_tribe_to_earth.html>

##### [Penelope Boston quoted: "I think that the chance of life having arisen on Mars, sometime in its past, is maybe one in..."](http://www.ted.com/quotes/i_think_that_the_chance_of_life_having_arisen_on_mars_sometim.html)

[Penelope Boston says there might be life on Marshttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/i_think_that_the_chance_of_life_having_arisen_on_mars_sometim.html)

"I think that the chance of life having arisen on Mars, sometime in its past, is maybe one in four to maybe even half and half. — Penelope Boston (at 06:42)"

<http://www.ted.com/quotes/i_think_that_the_chance_of_life_having_arisen_on_mars_sometim.html>

##### [Steven Strogatz quoted: "It’s a deep tendency toward order in nature that opposes what we’ve all been taught about en..."](http://www.ted.com/quotes/it_s_a_deep_tendency_toward_order_in_nature_that_opposes_what.html)

[Steven Strogatz on synchttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/it_s_a_deep_tendency_toward_order_in_nature_that_opposes_what.html)

"It’s a deep tendency toward order in nature that opposes what we’ve all been taught about entropy. I’m not saying the law of entropy is wrong — it’s not. But there is a countervailing force in the universe — the tendency towards spontaneous order. — Steven Strogatz (at 02:28)"

<http://www.ted.com/quotes/it_s_a_deep_tendency_toward_order_in_nature_that_opposes_what.html>

##### [Charles Elachi quoted: "We literally are all made out of stardust. We started from those stars; we are made of stardu..."](http://www.ted.com/quotes/we_literally_are_all_made_out_of_stardust_we_started_from_tho.html)

[Charles Elachi on the Mars Rovershttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/we_literally_are_all_made_out_of_stardust_we_started_from_tho.html)

"We literally are all made out of stardust. We started from those stars; we are made of stardust. So, next time you are really depressed, look in the mirror and you can look and say, hi, I’m looking at a star here. — Charles Elachi (at 05:25)"

<http://www.ted.com/quotes/we_literally_are_all_made_out_of_stardust_we_started_from_tho.html>

##### [Penelope Boston quoted: "I have learned to think about Earth as an extraterrestrial planet."](http://www.ted.com/quotes/i_have_learned_to_think_about_earth_as_an_extraterrestrial_pla.html)

[Penelope Boston says there might be life on Marshttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/i_have_learned_to_think_about_earth_as_an_extraterrestrial_pla.html)

"I have learned to think about Earth as an extraterrestrial planet. — Penelope Boston (at 08:55)"

<http://www.ted.com/quotes/i_have_learned_to_think_about_earth_as_an_extraterrestrial_pla.html>

##### [Penelope Boston quoted: "I’m very passionately interested in the human future, on the Moon and Mars particularly, and..."](http://www.ted.com/quotes/i_m_very_passionately_interested_in_the_human_future_on_the_m.html)

[Penelope Boston says there might be life on Marshttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/i_m_very_passionately_interested_in_the_human_future_on_the_m.html)

"I’m very passionately interested in the human future, on the Moon and Mars particularly, and elsewhere in the solar system. I think it’s time that we transitioned to a solar system-going civilization and species. — Penelope Boston (at 01:10)"

<http://www.ted.com/quotes/i_m_very_passionately_interested_in_the_human_future_on_the_m.html>

##### [Freeman Dyson quoted: "It’s not going to be just humans colonizing space, it’s going to be life moving out from the E..."](http://www.ted.com/quotes/it_s_not_going_to_be_just_humans_colonizing_space_it_s_going.html)

[Freeman Dyson: Let's look for life in the outer solar systemhttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/it_s_not_going_to_be_just_humans_colonizing_space_it_s_going.html)

"It’s not going to be just humans colonizing space, it’s going to be life moving out from the Earth, moving it into its kingdom. And the kingdom of life, of course, is going to be the universe. — Freeman Dyson (at 18:15)"

<http://www.ted.com/quotes/it_s_not_going_to_be_just_humans_colonizing_space_it_s_going.html>

##### [Peter Diamandis quoted: "Life on Earth is at an ever-increasing risk of being wiped out by disaster. … I think the hu..."](http://www.ted.com/quotes/life_on_earth_is_at_an_ever_increasing_risk_of_being_wiped_out.html)

[Peter Diamandis on Stephen Hawking in zero ghttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/life_on_earth_is_at_an_ever_increasing_risk_of_being_wiped_out.html)

"Life on Earth is at an ever-increasing risk of being wiped out by disaster. … I think the human race doesn’t have a future if it doesn’t go into space. I therefore want to encourage public interest in space. — Peter Diamandis (at 01:56)"

<http://www.ted.com/quotes/life_on_earth_is_at_an_ever_increasing_risk_of_being_wiped_out.html>

<http://www.ted.com/quotes/for_days_after_the_launch_sputnik_was_a_wonderful_curiosity.html>

##### [Brian Cox quoted: "The aim of particle physics is to understand what everything’s made of, and how everything sticks ..."](http://www.ted.com/quotes/the_aim_of_particle_physics_is_to_understand_what_everything_s.html)

[Brian Cox: CERN's supercolliderhttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/the_aim_of_particle_physics_is_to_understand_what_everything_s.html)

"The aim of particle physics is to understand what everything’s made of, and how everything sticks together. By everything I mean me and you, the Earth, the Sun, the 100 billion suns in our galaxy and the 100 billion galaxies in the observable universe. Absolutely ... (at 02:16)"

<http://www.ted.com/quotes/the_aim_of_particle_physics_is_to_understand_what_everything_s.html>

##### [Peter Diamandis quoted: "It’s during our lifetime that we’re moving off this planet. Please join us in this epic adve..."](http://www.ted.com/quotes/it_s_during_our_lifetime_that_we_re_moving_off_this_planet_pl.html)

[Peter Diamandis on Stephen Hawking in zero ghttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/it_s_during_our_lifetime_that_we_re_moving_off_this_planet_pl.html)

"It’s during our lifetime that we’re moving off this planet. Please join us in this epic adventure. — Peter Diamandis (at 03:48)"

<http://www.ted.com/quotes/it_s_during_our_lifetime_that_we_re_moving_off_this_planet_pl.html>

##### [Neil Turok quoted: "It may be that we live in an endless universe, both in space and in time. And there’ve been Bangs..."](http://www.ted.com/quotes/it_may_be_that_we_live_in_an_endless_universe_both_in_space_a.html)

[Neil Turok makes his TED Prize wishhttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/it_may_be_that_we_live_in_an_endless_universe_both_in_space_a.html)

"It may be that we live in an endless universe, both in space and in time. And there’ve been Bangs in the past, and there will be Bangs in the future. — Neil Turok (at 08:57)"

<http://www.ted.com/quotes/it_may_be_that_we_live_in_an_endless_universe_both_in_space_a.html>

##### [Vilayanur Ramachandran quoted: "Here is this three-pound mass of jelly you can hold in the palm of your hand, and it ..."](http://www.ted.com/quotes/here_is_this_three_pound_mass_of_jelly_you_can_hold_in_the_pal.html)

[VS Ramachandran: 3 clues to understanding your brainhttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/here_is_this_three_pound_mass_of_jelly_you_can_hold_in_the_pal.html)

"Here is this three-pound mass of jelly you can hold in the palm of your hand, and it can contemplate the vastness of interstellar space. It can contemplate the meaning of infinity and it can contemplate itself contemplating on the meaning of infinity. — Vilayanur ... (at 00:25)"

<http://www.ted.com/quotes/here_is_this_three_pound_mass_of_jelly_you_can_hold_in_the_pal.html>

##### [Stephen Petranek quoted: "Everything that we need to make an atmosphere on Mars, and to make a livable planet on Mars..."](http://www.ted.com/quotes/everything_that_we_need_to_make_an_atmosphere_on_mars_and_to.html)

[Stephen Petranek counts down to Armageddonhttp://www.ted.com/images/reboot/icon_medallion_quote.png](http://www.ted.com/quotes/everything_that_we_need_to_make_an_atmosphere_on_mars_and_to.html)

"Everything that we need to make an atmosphere on Mars, and to make a livable planet on Mars, is probably there. — Stephen Petranek (at 19:21)"

<http://www.ted.com/quotes/everything_that_we_need_to_make_an_atmosphere_on_mars_and_to.html>

##### [Michelle Borkin: Can astronomers help doctors?](http://www.ted.com/talks/michelle_borkin_can_astronomers_help_doctors.html)

[Michelle Borkin: Can astronomers help doctors?http://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/michelle_borkin_can_astronomers_help_doctors.html)

How do you measure a nebula? With a brain scan. In this talk, TED Fellow Michelle Borkin shows why collaboration between doctors and astronomers can lead to surprising discoveries. (Filmed at TEDxBoston.)

<http://www.ted.com/talks/michelle_borkin_can_astronomers_help_doctors.html>

##### [Phil Plait: How to defend Earth from asteroids](http://www.ted.com/talks/phil_plait_how_to_defend_earth_from_asteroids.html)

[Phil Plait: How to defend Earth from asteroidshttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/phil_plait_how_to_defend_earth_from_asteroids.html)

I want to talk to you about something kind of big. We'll start here. 65 million years ago the dinosaurs had a bad day. (Laughter) A chunk of rock six miles across, moving something like 50 times the speed of a rifle bullet, slammed into the Earth. It released its ...

<http://www.ted.com/talks/phil_plait_how_to_defend_earth_from_asteroids.html>

##### [Sean Carroll: Distant time and the hint of a multiverse](http://www.ted.com/talks/sean_carroll_distant_time_and_the_hint_of_a_multiverse.html)

[Sean Carroll: Distant time and the hint of a multiversehttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/sean_carroll_distant_time_and_the_hint_of_a_multiverse.html)

The universe is really big. We live in a galaxy, the Milky Way Galaxy. There are about a hundred billion stars in the Milky Way Galaxy. And if you take a camera and you point it at a random part of the sky, and you just keep the shutter open, as long as your camera ...

<http://www.ted.com/talks/sean_carroll_distant_time_and_the_hint_of_a_multiverse.html>

##### [Dimitar Sasselov: How we found hundreds of potential Earth-like planets](http://www.ted.com/talks/dimitar_sasselov_how_we_found_hundreds_of_potential_earth_like_planets.html)

[Dimitar Sasselov: How we found hundreds of potential Earth-like planetshttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/dimitar_sasselov_how_we_found_hundreds_of_potential_earth_like_planets.html)

Well, indeed, I'm very, very lucky. My talk essentially got written by three historic events that happened within days of each other in the last two months -- seemingly unrelated, but as you will see, actually all having to do with the story I want to tell you today ...

<http://www.ted.com/talks/dimitar_sasselov_how_we_found_hundreds_of_potential_earth_like_planets.html>

##### [Carter Emmart demos a 3D atlas of the universe](http://www.ted.com/talks/carter_emmart_demos_a_3d_atlas_of_the_universe.html)

[Carter Emmart demos a 3D atlas of the universe http://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/carter_emmart_demos_a_3d_atlas_of_the_universe.html)

It's a great honor today to share with you The Digital Universe, which was created for humanity to really see where we are in the universe. And so I think we can roll the video that we have. [The Himalayas.] (Music) The flat horizon that we've evolved with has been ...

<http://www.ted.com/talks/carter_emmart_demos_a_3d_atlas_of_the_universe.html>

##### [Jor-El: Last-ditch appeal to save the planet](http://www.ted.com/talks/last_ditch_appeal_to_save_the_planet.html)

[Jor-El: Last-ditch appeal to save the planethttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/last_ditch_appeal_to_save_the_planet.html)

(This clip from the classic "Superman" TV show was originally posted for April Fool's Day, but is staying on the site by popular request.) With the planet facing a growing threat from the sun, this passionate speech from the geo-visionary known as Jor-El challenge...

<http://www.ted.com/talks/last_ditch_appeal_to_save_the_planet.html>

##### [Richard Feynman: Physics is fun to imagine](http://www.ted.com/talks/richard_feynman.html)

[Richard Feynman: Physics is fun to imaginehttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/richard_feynman.html)

In this archival footage from BBC TV, celebrated physicist Richard Feynman explains what fire, magnets, rubber bands (and more) are like at the scale of the jiggling atoms they're made of. This accessible, enchanting conversation in physics reveals a teeming nano-...

<http://www.ted.com/talks/richard_feynman.html>

##### [Sean Carroll on the arrow of time (Part 1)](http://www.ted.com/talks/sean_carroll_on_the_arrow_of_time.html)

[Sean Carroll on the arrow of time (Part 1)http://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/sean_carroll_on_the_arrow_of_time.html)

In Part 1 of his lecture at the University of Sydney, cosmologist Sean Carroll gives an entertaining and thought-provoking talk about the nature of time, the origin of entropy, and how what happened before the Big Bang might be responsible for the arrow of time we...

<http://www.ted.com/talks/sean_carroll_on_the_arrow_of_time.html>

##### [Sean Carroll on the arrow of time (Part 2)](http://www.ted.com/talks/sean_carroll_on_the_arrow_of_time_part_2.html)

[Sean Carroll on the arrow of time (Part 2)http://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/sean_carroll_on_the_arrow_of_time_part_2.html)

In Part 2 of his lecture at the University of Sydney, cosmologist Sean Carroll continues his entertaining and thought-provoking talk about the nature of time, the origin of entropy, and how what happened before the Big Bang might be responsible for the arrow of ti...

<http://www.ted.com/talks/sean_carroll_on_the_arrow_of_time_part_2.html>

##### [Charles Fleischer insists: All things are Moleeds](http://www.ted.com/talks/charles_fleischer_insists_all_things_are_moleeds.html)

[Charles Fleischer insists: All things are Moleedshttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/charles_fleischer_insists_all_things_are_moleeds.html)

I am going to be talking about secrets. Obviously the best way to divulge a secret is to tell someone to not say anything about it. (Laughter) Secrets. I'm using PowerPoint this year just because, you know, I'm into the TED thing. (Laughter) And when you use these ...

<http://www.ted.com/talks/charles_fleischer_insists_all_things_are_moleeds.html>

##### [Tom Wujec demos the 13th-century astrolabe](http://www.ted.com/talks/tom_wujec_demos_the_13th_century_astrolabe.html)

[Tom Wujec demos the 13th-century astrolabehttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/tom_wujec_demos_the_13th_century_astrolabe.html)

As technology progresses, and as it advances, many of us assume that these advances make us more intelligent, make us smarter and more connected to the world. And what I'd like to argue is that that's not necessarily the case, as progress is simply a word for change ...

<http://www.ted.com/talks/tom_wujec_demos_the_13th_century_astrolabe.html>

##### [Carolyn Porco: Could a Saturn moon harbor life?](http://www.ted.com/talks/carolyn_porco_could_a_saturn_moon_harbor_life.html)

[Carolyn Porco: Could a Saturn moon harbor life?http://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/carolyn_porco_could_a_saturn_moon_harbor_life.html)

Two years ago here at TED I reported that we had discovered at Saturn, with the Cassini Spacecraft, an anomalously warm and geologically active region at the southern tip of the small Saturnine moon Enceladus, seen here. This region seen here for the first time in ...

<http://www.ted.com/talks/carolyn_porco_could_a_saturn_moon_harbor_life.html>

[Brian Cox: What went wrong at the LHC](http://www.ted.com/talks/brian_cox_what_went_wrong_at_the_lhc.html)

[Brian Cox: What went wrong at the LHChttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/brian_cox_what_went_wrong_at_the_lhc.html)

Last year at TED I gave an introduction to the LHC. And I promised to come back and give you an update on how that machine worked. So this is it. And for those of you that weren't there, the LHC is the largest scientific experiment ever attempted -- 27 kilometers ...

<http://www.ted.com/talks/brian_cox_what_went_wrong_at_the_lhc.html>

##### [George Smoot: The design of the universe](http://www.ted.com/talks/george_smoot_on_the_design_of_the_universe.html)

[George Smoot: The design of the universehttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/george_smoot_on_the_design_of_the_universe.html)

I thought I would think about changing your perspective on the world a bit, and showing you some of the designs that we have in nature. And so, I have my first slide to talk about the dawning of the universe and what I call the cosmic scene investigation, that is, ...

<http://www.ted.com/talks/george_smoot_on_the_design_of_the_universe.html>

##### [Patricia Burchat: Shedding light on dark matter](http://www.ted.com/talks/patricia_burchat_leads_a_search_for_dark_energy.html)

[Patricia Burchat: Shedding light on dark matterhttp://www.ted.com/images/play_icon.gif](http://www.ted.com/talks/patricia_burchat_leads_a_search_for_dark_energy.html)

As a particle physicist, I study the elementary particles and how they interact on the most fundamental level. For most of my research career, I've been using accelerators, such as the electron accelerator at Stanford University, just up the road, to study things on ...

<http://www.ted.com/talks/patricia_burchat_leads_a_search_for_dark_energy.html>

NSTA final Science standards

* **HS-ESS1-1. Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun’s core to release energy that eventually reaches Earth in the form of radiation.** [Clarification Statement: Emphasis is on the energy transfer mechanisms that allow energy from nuclear fusion in the sun’s core to reach Earth. Examples of evidence for the model include observations of the masses and lifetimes of other stars, as well as the ways that the sun’s radiation varies due to sudden solar flares (“space weather”), the 11-year sunspot cycle, and non-cyclic variations over centuries.] [Assessment Boundary: Assessment does not include details of the atomic and sub-atomic processes involved with the sun’s nuclear fusion.]
* **HS-ESS1-2. Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe**. [Clarification Statement: Emphasis is on the astronomical evidence of the red shift of light from galaxies as an indication that the universe is currently expanding, the cosmic microwave background as the remnant radiation from the Big Bang, and the observed composition of ordinary matter of the universe, primarily found in stars and interstellar gases (from the spectra of electromagnetic radiation from stars), which matches that predicted by the Big Bang theory (3/4 hydrogen and 1/4 helium).]
* **HS-ESS1-3. Communicate scientific ideas about the way stars, over their life cycle, produce elements.** [Clarification Statement: Emphasis is on the way nucleosynthesis, and therefore the different elements created, varies as a function of the mass of a star and the stage of its lifetime.] [Assessment Boundary: Details of the many different nucleosynthesis pathways for stars of differing masses are not assessed.]
* **HS-ESS1-4. Use mathematical or computational representations to predict the motion of orbiting objects in the solar system**. [Clarification Statement: Emphasis is on Newtonian gravitational laws governing orbital motions, which apply to human-made satellites as well as planets and moons.] [Assessment Boundary: Mathematical representations for the gravitational attraction of bodies and Kepler’s Laws of orbital motions should not deal with more than two bodies, nor involve calculus.]
* **HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.** [Clarification Statement: Emphasis is on the ability of plate tectonics to explain the ages of crustal rocks. Examples include evidence of the ages oceanic crust increasing with distance from mid-ocean ridges (a result of plate spreading) and the ages of North American continental crust increasing with distance away from a central ancient core (a result of past plate interactions).]
* **HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth’s formation and early history.** [Clarification Statement: Emphasis is on using available evidence within the solar system to reconstruct the early history of Earth, which formed along with the rest of the solar system 4.6 billion years ago. Examples of evidence include the absolute ages of ancient materials (obtained by radiometric dating of meteorites, moon rocks, and Earth’s oldest minerals), the sizes and compositions of solar system objects, and the impact cratering record of planetary surfaces.]